What is claimed is:

1. A friction stir welding method comprising:

retreating a rotary tool from members being welded when said rotary tool moving along a joint line reaches a position where the direction of the joint line changes;

changing the direction of said rotary tool or said members being welded;

reinserting said rotary tool to said members being welded substantially at the position where said tool was retreated; and

moving said rotary tool along a new joint line.

2. A friction stir welding method according to claim 1, wherein said direction is changed by retreating said tool and then rotating a device that supports said rotary tool, thereby varying the tilt angle of said rotary tool against the direction of movement thereof.

3. A friction stir welding method according to claim 1, wherein the tilt angle of said rotary tool is varied with said retreating position set as reference.

4. A friction stir welding method according to claim 1, wherein the tilt angle of said rotary tool is varied with the tip of said rotary tool set as reference.

5. A friction stir welding method according to claim 1, wherein the insertion depth of said rotary tool at the time of reinsertion is deeper than the insertion depth of said rotary tool before being retreated from said retreating position.

6. A friction stir welding method according to claim 5, further comprising:

gradually reducing the insertion depth of said rotary tool before retreating the same; and

upon reinsertion, inserting the rotary tool to a depth equal to the insertion depth of said tool before the gradual reduction of depth.

7. A friction stir welding method according to claim 5, further comprising:

upon reinsertion, inserting the rotary tool to a depth deeper than the insertion depth of said rotary tool before being retreated; and

gradually reducing the insertion depth after starting the movement of said rotary tool.

8. A friction stir welding method according to claim 1, wherein retreating of said rotary tool is performed after stopping the movement of said rotary tool.

9. A friction stir welding method according to claim 1,

wherein said direction is changed by retreating said tool and then rotating said members being welded, thereby varying the tilt angle of said rotary tool against the direction of movement thereof.

10. A friction stir welding method comprising:

abutting an end portion of a first member against an end portion of a second member;

said abutted line or joint line being varied greatly; and

relatively moving a rotary tool against said joint line based on a data stored in advance.

11. A friction stir welding method according to claim 10, comprising:

setting said rotary tool to a predetermined position on said first member or said second member;

storing said position into a memory as the starting point; and

relatively moving said rotary tool to said predetermined position on the abutted portion based on the data stored in advance.

12. A friction stir welding method comprising:

abutting an end portion of a first member against an end portion of a second member having a projection formed to said end portion;

fillet welding said end portion of said second member along said projection; and

friction stir welding said members by inserting a rotary tool to the abutted portion.

13. A friction stir welding method according to claim 12, comprising:

friction stir welding said members by inserting an end of a large-diameter portion that is positioned at the border between a small-diameter portion and the large-diameter portion of said rotary tool to the metal constituting said fillet weld.

14. A friction stir welding method according to claim 12, wherein the relative movement of said rotary tool against said first and second members is performed based on a data stored in advance.

15. A friction stir welding method according to claim 12, further comprising:

setting said rotary tool to a predetermined position on said first member or said second member;

storing said predetermined position as the starting point; and

moving said rotary tool to said predetermined position on the abutted portion based on a data stored in advance.